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(54) **Solar panel system**

(57) A solar panel assembly having a foundation tube, a rotary actuator mounted in the foundation tube for changing the azimuth of the panel and a linear actuator mounted to the foundation tube for controlling the elevation angle of the panel. The linear actuator utilizes a spindle drive. The rotary actuator includes a motor and gearbox; a drive screw connected to the motor; a spindle screw, one end of which provides an output of the rotary actuator; a drive nut having a first threaded hole for receiving a thread of the drive screw and a second threaded hole for receiving a thread of the spindle screw, the guide nut having a guide fin; and a guide rail interacting with the nut guide fin to constrain the nut from rotating, whereby the rotation of the drive by screw by operation of the motor causes the nut to translate linearly which in turn causes the spindle screw to rotate.

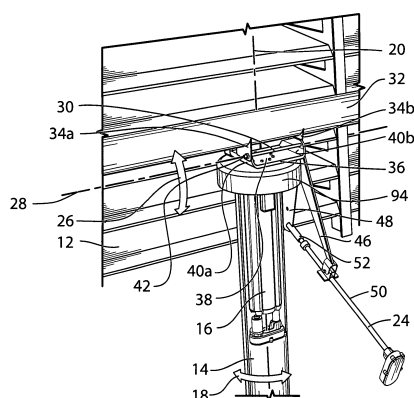


FIG.1



EUROPEAN SEARCH REPORT

Application Number
EP 11 00 9219

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	KR 2009 0076873 A (JINYOUNG ENGINEERING CO LTD [KR]) 13 July 2009 (2009-07-13) * abstract; figures 1--7 *	1-9	INV. F24J2/54 F16H25/18 F16H25/20
A	DE 20 2009 011929 U1 (DIETER KITTO WERKZEUG UND MASC [DE]) 10 December 2009 (2009-12-10) * paragraphs [0021] - [0029]; figures 1-4 *	1-9	
A	JP 2007 180484 A (TEC OKAZAKI KK) 12 July 2007 (2007-07-12) * abstract *	1-9	
A	EP 2 071 254 A2 (VIPIEMME SOLAR S R L [IT]) 17 June 2009 (2009-06-17) * the whole document *	1-9	
A	DE 10 2005 013334 A1 (KRUEGER ELEKTROTECHNIK GMBH [DE]) 28 September 2006 (2006-09-28) * the whole document *	1-9	
A	EP 1 860 386 A1 (CARDISA MOBILIARIO URBANO S L [ES]) 28 November 2007 (2007-11-28) * the whole document *	1-9	TECHNICAL FIELDS SEARCHED (IPC) F24J
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 20 February 2013	Examiner Axters, Michael
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

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☒ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

1-9

☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).



LACK OF UNITY OF INVENTION
SHEET B

Application Number

EP 11 00 9219

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-9

A solar panel assembly comprising a rotary actuator mounted in a foundation tube and having a rotating plate extending out of the foundation tube, a bracket mounted to the rotating plate, the bracket having an arm mounted to a linear actuator, a frame being pivotally mounted to the bracket and the frame having an arm connected to the linear actuator.

2. claims: 10-12

A rotary actuator comprising a motor, a gearbox, a drive screw, a spindle screw, a drive nut and a guide rail.

3. claims: 13-15

A solar panel assembly comprising a motorized drive for adjusting the elevation of the panel, at least first and second batteries, a motor drive circuit connected to the batteries, a stow sensor providing a signal indicating a command to move the panel to a horizontal position, and a stow circuit receiving the stow signal, wherein in a nominal state the stow circuit connects the at least first and second batteries in parallel and applies an output of the parallel-connected batteries to the motor drive circuit and, in the event the stow signal is activated, the stow circuit connects the at least first and second batteries in series, disconnects the motor drive circuit from the motorized drive, and applies an output of the serial-connected batteries directly to the motor.

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 11 00 9219

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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20-02-2013

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82